AMENDMENTS TO THE CLAIMS

1. (currently amended) An edge detector for detecting an edge of an object, said edge detector comprising:

a first optical fiber, with a receiving end and a transmitting end, adapted to receive laser light at the receiving end and create a light beam at the transmitting end;

a second optical fiber, with a receiving end and a transmitting end, positioned such that the receiving end of the second optical fiber receives the light beam and transmits light to the transmitting end of the second optical fiber; and

a single optical power detector optically coupled to the transmitting end of the second optical fiber, the optical power detector having an output P indicative of the optical power of the light transmitted through the second optical fiber, the output P having a maximum value P_{max} when no object is within the light beam and a minimum value P_{min} when the object is fully within the light beam;

wherein the edge of the object is detected when the object partially obstructs the light beam, such that the output P of the single optical power detector is less than the maximum value P_{max} ~~output when the object is not within the light beam~~ and greater than the minimum value P_{min} ~~output when the object is fully within the light beam~~.

2. (original) The edge detector of claim 1, further comprising a laser light source coupled to the receiving end of the first optical fiber.

3. (original) The edge detector of claim 1, further comprising:

a mirror positioned to reflect said light beam;

wherein the receiving end of the second optical fiber receives the light beam after it has been reflected by the mirror.

4. (original) The edge detector of claim 1, wherein at least one of the first and second optical fibers is a single mode optical fiber.

5. (original) The edge detector of claim 1, wherein the light beam is less than 10 microns in diameter.

6. (previously amended) The edge detector of claim 1, wherein the transmitting end of the first optical fiber and the receiving end of the second optical fibers are held in opposition by a retainer.

7. (original) The edge detector of claim 6, wherein said retainer further comprises:

a frame; and

at least one retaining block attached to the frame,

wherein the first and second fibers are constrained to lie in one or more channels formed between the frame and the at least one retaining block.

8. (currently amended) A device for positioning an edge of an object, said device comprising:

a laser light source;

a first optical fiber, with a receiving end and a transmitting end, optically coupled to the laser light source at the receiving end and creating a light beam at the transmitting end;

an optical power detector, providing an optical power signal $\underline{P}$ as output, <u>the optical power signal having a maximum value P_{max} when no object is within the light beam and a minimum value P_{min} when the object is fully within the light beam</u>;

a second optical fiber, with a receiving end and a transmitting end, optically coupled to the optical power detector at the transmitting end;

a retainer for holding said first and second optical fibers such that the receiving end of the second optical fiber receives the light beam;

a positioning stage for adjusting the relative positions of the object and the light beam; and

a controller operably coupled to the positioning stage and responsive to the optical power signal, the controller being configured to cause the positioning stage to position the edge of the object at a predetermined position within the light beam, such that the level of the optical power signal $\underline{P}$ is less than the <u>maximum value P_{max}</u>

~~output when the object is not within the light beam~~ and greater than the <u>minimum value P_{min}</u> ~~output when the object is fully within the light beam~~.

9. (original) A device as in claim 8, wherein the controller is manually operated.

10. (original) A device as in claim 8, wherein the controller is an automatic controller.

11. (original) A device as in claim 8, wherein the position of the object relative to the light beam is adjusted so that the optical power signal is greater than a lower threshold and less than an upper threshold.

12. (original) A device as in claim 11, wherein at least one of the lower and upper thresholds is proportional to a maximum power which is the optical power at the detector when no part of the object obstructs the light beam.

13. (original) A device as in claim 12, wherein the maximum power is predetermined by a calibration.

14. (previously amended) A device as in claim 12, wherein the maximum power is measured periodically during operation of the device.

15. (original) A device as in claim 11, wherein at least one of the lower and upper thresholds is dependent upon a minimum power, which is the optical power at the detector when the light beam is completely interrupted by the object, and upon a

maximum power, which is the optical power at the detector when no part of the object obstructs the light beam.

16. (original) A device as in claim 8, wherein the object is supported by the positioning stage.

17. (original) A device as in claim 8, wherein the retainer is coupled to the positioning stage.

18. (current amended) An edge detector in accordance with claim 1, further ~~for detecting an edge of an object, said edge detector~~ comprising:

an optical coupler having at least three ports, the optical coupler being adapted to receive laser light at a first port of the at least three ports, coupled to the receiving end of the first optical fiber at a second port of the at least three ports and coupled to the receiving end of the second optical fiber at a third port of the at least three ports;.

~~an optical fiber optically coupled to and receiving laser light from a second port of the at least three ports at a first end and creating a light beam at a second end;~~

a mirror separated from the ~~second~~ transmitting end of the first optical fiber by a gap and positioned to receive the laser light beam and reflect it back to the ~~second~~ transmitting end of the optical fiber; and

a retainer for holding the first optical fiber and the mirror;~~ and~~

~~an optical power meter optically coupled to a third port of the at least three ports, the optical power meter having an output indicative of the optical power of the light transmitted through the second optical fiber;.~~

wherein the edge of the object is detected when an object in the gap at least partially obstructs the light beam, causing a change in the output *P* of the optical power meter.

19. (original) The edge detector of claim 18, further comprising a laser light source optically coupled to the first port of the at least three ports.

20. (currently amended) The edge detector of claim 18, wherein the first optical fiber is a single mode optical fiber.

21. (original) The edge detector of claim 18, further comprising:

a positioning stage for adjusting the relative positions of the object and the light beam; and

a controller operably coupled to the positioning stage and responsive to the optical power signal, the controller being configured to cause the positioning stage to position the object at a predetermined position relative to the light beam.

22. (original) A device as in claim 21, wherein the controller is manually operated.

23. (original) A device as in claim 21, wherein the controller is an automatic controller.

24. (original) A device as in claim 21, wherein the position of the object relative to the light beam is adjusted so that the optical power signal is greater than a lower threshold and less than an upper threshold.

25. (original) A device as in claim 24, wherein at least one of the lower and upper thresholds is proportional to a maximum power which is the optical power at the detector when no part of the object obstructs the light beam.

26. (original) A device as in claim 18, wherein the optical coupler is an optical circulator with at least three ports.

27. (currently amended) A system for detecting an edge of an object, said system comprising:

an edge detector, said edge detector comprising:

a first optical fiber, with a receiving end and a transmitting end, adapted to receive laser light at the receiving end and create a light beam at the transmitting end;

a second optical fiber, with a receiving end and a transmitting end, positioned such that the receiving end of the second optical fiber

receives the light beam and transmits light to the transmitting end of the second optical fiber; and

an optical power detector optically coupled to the transmitting end of the second optical fiber, the optical power detector having an output P indicative of the optical power of the light transmitted through the second optical fiber, the output P having a maximum value P_{max} when no object is within the light beam and a minimum value P_{min} when the object is fully within the light beam;

an object positioning stage for adjusting the position of the object in a first direction; and

a detector positioning stage for adjusting the position of the edge detector in a second direction;

wherein the edge of the object is detected when the object partially obstructs the light beam, such that the output P of the optical power detector is less than the maximum value P_{max} ~~output when the object is not within the light beam~~ and greater than the minimum value P_{min} ~~output when the object is fully within the light beam~~.

28. (previously amended) A system as in claim 27, further comprising a controller operably coupled to the object positioning stage and the detector positioning stage and responsive to the optical power signal, the controller being configured to cause the object positioning stage and the detector positioning stage to position the edge of the object at a predetermined position relative to the light beam and hold the

object stationary.

29. (original) A system as in claim 27, further comprising an object holder mounted on the object positioning stage for holding one or more objects.

30. (original) A system as in claim 27, further comprising a detector holder mounted on the detector positioning stage for holding the edge detector.

31. (previously amended) A system as in claim 30, further comprising an edge detector calibration fiduciary attached to the detector holder at a known location for use in the calibration of the edge detector.

32. (original) A system as in claim 27, wherein the first direction is substantially perpendicular to the second direction.

33. (original) A system as in claim 27, wherein the one of the object positioning stage and the detector positioning stage includes a linear servo-motor.

34. (previously amended) A method for positioning an edge of an object, said method comprising:

generating a light beam by passing light from a laser light source through a first optical fiber;

receiving the light beam from the first optical fiber through a second optical fiber;

detecting the optical power of the received light; and

positioning the edge of the object within the light beam such that the second optical fiber is partially obscured and the optical power of the received light is greater than a lower threshold and less than an upper threshold.

35. (original) A method as in claim 34, wherein at least one of the lower and upper thresholds is proportional to a maximum power which is the optical power at the detector when no part of the object obstructs the light beam.

36. (original) A method as in claim 34, wherein the maximum power is predetermined by a calibration.

37. (previously amended) A method as in claim 34, wherein the maximum power is measured periodically during operation when the edge of the object is not within the light beam.

38. (original) A method as in claim 34, wherein the positioning is performed by a positioning stage.

39. (original) A method as in claim 38, wherein the object is supported by the positioning stage and said positioning is achieved by moving the object.

40. (original) A method as in claim 38, wherein the retainer is coupled to the positioning stage and said positioning is achieved by moving the retainer.

41. (original) A method as in claim 38, further comprising:

controlling the positioning stage in response to the optical power.

42. (original) A method as in claim 41, wherein said controlling comprises setting a target optical power and repeatedly moving the positioning stage by a distance proportional to the difference between the optical power and the target optical power until the optical power is greater than the lower threshold and less than the upper threshold.

43. (original) A method as in claim 41, wherein said controlling comprises setting a target optical power and repeatedly moving the positioning stage by a predetermined distance until the optical power is greater than the lower threshold and less than the upper threshold.

44. (previously added) A method in accordance with claim 34, wherein generating the light beam further comprises:

passing the laser light to an optical coupler, the optical coupler being coupled to the first optical fiber at a first port and to the second optical fiber at a second port; and

passing the laser light through a third optical fiber, coupled at a first end to a third port of the optical coupler, the light beam being generated at a second end of the third optical fiber;

and wherein receiving the light beam further comprises:

receiving the light at the second end of the third optical fiber after it has been reflected by a mirror, the mirror being separated from the second end of the third optical fiber by a gap and positioned to receive the light beam and reflect it back to the second end of the third optical fiber;

passing the received light from the third optical fiber to the third port of the optical coupler; and

passing the received light from the second port of the optical coupler to the second optical fiber.